AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Previously Presented) A method of inspecting electrical circuits comprising:

obtaining first image data relating to at least a part of an electrical circuit;

obtaining second image data generally corresponding to said part of the electrical circuit, said second image data including at least some image data for an optical characteristic that is different from said first image data;

generating a first representation of said electrical circuit from said first image data independently of said second image data;

modifying said first representation by employing said second image data thereby to produce an enhanced representation of the electrical circuit; and

inspecting the enhanced representation with reference to a reference representation of the electrical circuit to detect defects in the electrical circuit.

2. (Original) A method of inspecting electrical circuits according to claim 1 and wherein said first image data is in a first spectral range and second image data includes at least some image data in a second spectral range.

3. (Original) A method of inspecting electrical circuits according to claim 1 and also comprising:

enhancing contrast between at least some parts of said second image data representing corresponding parts of the electrical circuit.

4. (Original) A method of inspecting electrical circuits according to claim 3 and wherein said enhancing contrast is non-linear.

5. (Original) A method of inspecting electrical circuits according to claim 3 and wherein said enhancing contrast includes redefining substrate portions not overlaying conductors in said second image data as opaque substrate portions, thus generally eliminating any distinction between substrate portions which overlay conductors and substrate portions which do not.

6. (Original) A method of inspecting electrical circuits according to claim 2 and also comprising:

enhancing contrast between at least some parts of said second image data representing corresponding parts of the electrical circuit.

7. (Original) A method of inspecting electrical circuits according to claim 6 and wherein said enhancing contrast is non-linear.

8. (Previously Presented) A method of inspecting electrical circuits according to claim 1 and wherein said generating a first representation comprises convolving said first image data with a function.

9. (Original) A method of inspecting electrical circuits according to claim 8 and wherein said function is an approximation of a Laplacian of a Gaussian function.

10. (Original) A method of inspecting electrical circuits according to claim 8 and wherein said modifying is carried out following said convolving.

11. (Original) A method of inspecting electrical circuits according to claim 6 and also comprising: convolving said first image data with a function.

12. (Original) A method of inspecting electrical circuits according to claim 11 and wherein said function is an approximation of a Laplacian of a Gaussian function.

13. (Original) A method of inspecting electrical circuits according to claim 11 and wherein said

modifying is carried out following said convolving.

14. (Original) A method of inspecting electrical circuits according to claim 1 and also comprising:

determining in said first image data approximate locations of transitions between image regions having distinguishable optical characteristics; and wherein

said modifying comprises removing undesired ones of said transitions.

15. (Original) A method of inspecting electrical circuits according to claim 1 and wherein said enhanced representation is a binary representation of said electrical circuit.

16. (Original) A method of inspecting electrical circuits according to claim 1 and wherein said enhanced representation is a representation of contours in said electrical circuit, which indicate approximate locations of transitions between regions in said electrical circuit exhibiting distinguishable optical characteristics.

17. (Original) A method of inspecting electrical circuits according to claim 1 and wherein said enhanced representation has a spatial resolution that is greater than the spatial resolution of said first and second image data.

18. (Original) A method of inspecting electrical circuits according to claim 17 and wherein said enhanced representation has a gray scale whose dynamic range is reduced as compared with the dynamic range of a gray scale of said first and second image data.

19. (Original) A method of inspecting electrical circuits according to claim 8 and also comprising:

determining in said first image data approximate locations of transitions between image regions having distinguishable optical characteristics; and wherein

said modifying includes overriding at least part of said convolved first image data.

20. (Original) A method of inspecting electrical circuits according to claim 8 and wherein said

enhanced representation is a binary representation of said electrical circuit.

21. (Original) A method of inspecting electrical circuits according to claim 8 and wherein said enhanced representation is a representation of contours in said electrical circuit, which indicate approximate locations of transitions between regions in said electrical circuit exhibiting distinguishable optical characteristics.

22. (Original) A method of inspecting electrical circuits according to claim 8 and wherein said enhanced representation has a spatial resolution that is greater than the spatial resolution of said first and second image data.

23. (Original) A method of inspecting electrical circuits according to claim 22 and wherein said enhanced representation has a gray scale whose dynamic range is reduced as compared with the dynamic range of a gray scale of said first and second image data.

24. (Previously Presented) A method of inspecting electrical circuits according to claim 1 and wherein said first and second image data are acquired with at least one imager comprising at least two different types of optical detectors arranged to view at least a portion of said electrical circuit illuminated by at least one illuminator.

25. (Previously Presented) A method of inspecting electrical circuits according to claim 24 and wherein said first and second image data are generally spatially coincidental, and each of said first and second image data are in a different spectral range.

26-43. (Cancelled)

44. (Previously Presented) A system for inspecting electrical circuits comprising:

a first image data acquisition assembly obtaining first image data relating to at least a part of an electrical circuit;

a second image data acquisition assembly obtaining second image data generally corresponding to said part of said electrical circuit, said second image data including at least

some image data for an optical characteristic that is different from said first image data;

a first representation generating module generating a first representation of said electrical circuit from said first image data independently of said second image data;

a first representation modifier modifying said first representation by employing said second image data thereby to produce an enhanced representation of the electrical circuit; and

a defect inspector, inspecting the enhanced representation with reference to a reference representation of the electrical circuit to detect defects in the electrical circuit.

45. (Original) A system for inspecting electrical circuits according to claim 44 and wherein said first image data is in a first spectral range and second image data includes at least some image data in a second spectral range.

46. (Original) A system for inspecting electrical circuits according to claim 44 and also comprising:

a contrast enhancer, enhancing contrast between at least some parts of said second image data representing corresponding parts of the electrical circuit.

47. (Original) A system for inspecting electrical circuits according to claim 46 and wherein said contrast enhancer enhances contrast in a non-linear manner.

48. (Original) A system for inspecting electrical circuits according to claim 46 and wherein said contrast enhancer is operative to redefine substrate portions not overlaying conductors in said second image data as opaque substrate portions, thus generally eliminating any distinction between substrate portions which overlay conductors and substrate portions which do not.

49. (Original) A system for inspecting electrical circuits according to claim 45 and also comprising:

a contrast enhancer, enhancing contrast between at least some parts of said second image data representing corresponding parts of the electrical circuit.

50. (Original) A system for inspecting electrical circuits according to claim 49 and wherein said contrast enhancer enhances contrast in a non-linear manner.

51. (Previously Presented) A system for inspecting electrical circuits according to claim 44 and wherein said first representation generator comprises a convolver, convolving said first image data with a function.

52. (Original) A system for inspecting electrical circuits according to claim 51 and wherein said function is an approximation of a Laplacian of a Gaussian function.

53. (Original) A system for inspecting electrical circuits according to claim 51 and wherein said modifier operates downstream of said convolver.

54. (Original) A system for inspecting electrical circuits according to claim 49 and also comprising:

a convolver, convolving said first image data with a function.

55. (Original) A system for inspecting electrical circuits according to claim 54 and wherein said function is an approximation of a Laplacian of a Gaussian function.

56. (Original) A system for inspecting electrical circuits according to claim 54 and wherein said modifier operates downstream of said convolver.

57. (Original) A system for inspecting electrical circuits according to claim 44 and also comprising:

a transition locator, determining in said first image data approximate locations of transitions between image regions having distinguishable optical characteristics; and wherein

said modifier is operative to remove undesired ones of said transitions.

58. (Original) A system for inspecting electrical circuits according to claim 44 and wherein said enhanced representation is a binary representation of said electrical circuit.

59. (Original) A system for inspecting electrical circuits according to claim 44 and wherein said enhanced representation is a representation of contours in said electrical circuit, which indicate approximate locations of transitions between regions in said electrical circuit exhibiting distinguishable optical characteristics.

60. (Original) A system for inspecting electrical circuits according to claim 44 and wherein said enhanced representation has a spatial resolution that is greater than the spatial resolution of said first and second image data.

61. (Original) A system for inspecting electrical circuits according to claim 60 and wherein said enhanced representation has a gray scale whose dynamic range is reduced as compared with the dynamic range of a gray scale of said first and second image data.

62. (Original) A system for inspecting electrical circuits according to claim 51 and also comprising:

a transition locator, determining in said first image data approximate locations of transitions between image regions having distinguishable optical characteristics; and wherein

said modifier is operative to override at least part of an output of said convolver.

63. (Original) A system for inspecting electrical circuits according to claim 51 and wherein said enhanced representation is a binary representation of said electrical circuit.

64. (Original) A system for inspecting electrical circuits according to claim 51 and wherein said enhanced representation is a representation of contours in said electrical circuit, which indicate approximate locations of transitions between regions in said electrical circuit exhibiting distinguishable optical characteristics.

65. (Original) A system for inspecting electrical circuits according to claim 51 and wherein said enhanced representation has a spatial resolution that is greater than the spatial resolution of said first and second image data.

66. (Original) A system for inspecting electrical circuits according to claim 65 and wherein said enhanced representation has a gray scale whose dynamic range is reduced as compared with the dynamic range of a gray scale of said first and second image data.

67. (Previously Presented) A system for inspecting electrical circuits according to claim 44 and wherein said first and second image data acquisition assemblies comprise at least one illuminator and at least one imager, comprising at least two different types of optical detectors and being arranged to view at least a portion of said electrical circuit illuminated by said at least one illuminator.

68. (Previously Presented) A system for inspecting electrical circuits according to claim 67 and wherein said imager comprises three types of detectors, each of which is operative to output generally spatially coincidental image data of said electrical circuit in a respective spectral range.

69-87. (Cancelled)